

What is Claimed is:

1. An ignition unit for a disposable childproof lighter which comprises two supporting walls and a flint supported by a resilient element at a position between said two supporting walls, wherein said ignition unit, which is adapted for rotatably mounting
5 between said two supporting walls, comprises:

a striker wheel having a plurality of striking teeth provided on an outer circumferential surface thereof for urging against said flint;

two driven gear elements for coaxially mounting said striker wheel between said two supporting walls, wherein each of said driven gear elements comprises a striker
10 driving wheel having an outer circumferential surface and a support shank integrally and coaxially protruded from an inner side of said striker driving wheel, wherein said two support shanks, which are smaller than said two striker driving wheels in diameter, are coaxially mounted on two sides of said striker wheel to define two supporting gaps between said two sides of said striker wheel and said two striker driving wheels
15 respectively, and said two striker driving wheels are arranged for respectively and rotatably mounting to said two supporting walls in such a manner that said striker wheel is capable of being driven to rotate when said two striker driving wheels are driven to rotate; and

two driving caps, which are a free rotating driving cap and a fixed driving cap
20 respectively, each comprising a driving ring and an inner sidewall extending from a circular edge of said driving ring, wherein each of said driving rings has a smooth outer circumferential slipping surface, an inner circumferential surface, and a circular driving cavity formed within said driving ring and said inner sidewall, said driving cavity of said free rotating driving cap having a diameter larger than that of said striker driving wheel
25 of said respective driven gear element such that said free rotating driving cap is normally free rotated with respect to said respective driven gear element, said driving cavity of said fixed driving cap having a diameter slightly larger than that of said striker driving wheel of said another driven gear element such that said fixed driving cap is normally engaged with said respective driven gear element, wherein each of said inner sidewalls has a
30 central support hole for said support shank of said respective driven gear element passing through while said respective striker driving wheel is received in said driving cavity,

wherein said two inner sidewalls of said driving caps are disposed in said two supporting gaps respectively so as to hold said two driving caps in a position between said striker wheel and said two driven gear elements respectively, wherein said free rotating driving cap and said fixed driving cap are arranged to engage with said striker driving wheels to
5 drive said driven gear elements to rotate respectively, so as to drive said striker wheel to rotate for striking against said flint to produce sparks.

2. The ignition unit, as recited in claim 1, further comprising a plurality of driving teeth spacedly provided on said inner circumferential surface of said free rotating driving cap and a plurality of driven gear teeth spacedly provided on said outer
10 circumferential surface of said striker driving wheel of said respective driven gear element, wherein said respective striker driving wheel is driven to rotate by said free rotating driving cap when said driven teeth are engaged with said driving teeth, wherein said free rotating driving cap is normally rotated about said respective driven gear element in a free rotatably movable manner unless a downward force is intentionally
15 applied on said free rotating driving cap while rotating said free rotating driving cap to drive said respective driven gear element and said striker wheel to rotate.

3. The ignition unit, as recited in claim 2, further comprising a second set of driving teeth spacedly provided on said inner circumferential surface of said fixed driving cap and a second set of driven gear teeth spacedly provided on said outer circumferential
20 surface of said striker driving wheel of said respective driven gear element, wherein said driving teeth of said fixed driving cap are normally engaged with said driven gear teeth of said fixed driving cap such that when said fixed driving cap is intentionally rotated, said respective driven gear element and said striker wheel are driven to rotate.

4. The ignition unit, as recited in claim 2, wherein said inner circumferential
25 surface of said fixed driving cap is normally and frictionally engaged with said outer circumferential surface of said striker driving wheel of said respective driven gear element such that said fixed driving cap is rotated to frictionally drive said respective driven gear element and said striker wheel to rotate.

5. The ignition unit, as recited in claim 2, wherein said slipping surface of
30 each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is

gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

6. The ignition unit, as recited in claim 3, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

7. The ignition unit, as recited in claim 4, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

8. The ignition unit, as recited in claim 1, wherein said free rotating driving cap is normally rotated about said respective driven gear element in a free rotatably movable manner unless a downward force is intentionally applied on said free rotating driving cap to frictionally engage said inner circumferential surface of said free rotating driving cap with said outer circumferential surface of said striker driving wheel of said respective driven gear element while rotating said free rotating driving cap to drive said respective driven gear element and said striker wheel to rotate.

9. The ignition unit, as recited in claim 8, further comprising a plurality of driving teeth spacedly provided on said inner circumferential surface of said fixed driving cap and a plurality of driven gear teeth spacedly provided on said outer circumferential surface of said striker driving wheel of said respective driven gear element, wherein said driving teeth of said fixed driving cap are normally engaged with said driven gear teeth of said fixed driving cap such that when said fixed driving cap is intentionally rotated, said respective driven gear element and said striker wheel are driven to rotate.

10. The ignition unit, as recited in claim 8, wherein said inner circumferential surface of said fixed driving cap is normally and frictionally engaged with said outer circumferential surface of said striker driving wheel of said respective driven gear element such that said fixed driving cap is rotated to frictionally drive said respective driven gear element and said striker wheel to rotate.

11. The ignition unit, as recited in claim 8, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

12. The ignition unit, as recited in claim 9, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

13. The ignition unit, as recited in claim 10, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

14. An ignition unit for a disposable childproof lighter which comprises two supporting walls and a flint supported by a resilient element at a position between said two supporting walls, wherein said ignition unit, which is adapted for rotatably mounting between said two supporting walls, comprises:

a striker wheel having a central axial hole, wherein a plurality of striking teeth are provided on an outer circumferential surface thereof for urging against said flint; and

two driving units for coaxially mounting said striker wheel between said two supporting walls, each comprising a circular-shaped driving ring having an outer circumferential slipping surface and a wheel axle coaxially extended from said driving ring to rotatably insert into said central axial hole of said striker wheel, wherein said wheel axle has a diameter substantially smaller than that of said central axial hole such that said striker wheel is normally free rotated with respect to said driving units, whereby an adult's thumb is large enough to apply a sufficient pressure on said slipping surfaces of said driving rings to deform a thumb surface of said adult to frictionally engage with said outer circumferential surface of said striker wheel so as to drive said striker wheel to rotate for striking against said flint to produce sparks.

15. The ignition unit, as recited in claim 14, wherein each of said driving units comprises a driven gear element and a driving cap, wherein said two driven gear elements is adapted for coaxially mounting said striker wheel between said two supporting walls, wherein each of said driven gear elements comprises a striker driving
5 wheel having an outer circumferential surface and a support shank integrally and coaxially protruded from an inner side of said striker driving wheel, wherein said two wheel axles are coaxially protruded from said two support shanks respectively to rotatably insert into two sides of said striker wheel to define two supporting gaps between said two sides of said striker wheel and said two striker driving wheels respectively, and
10 said two striker driving wheels are arranged for respectively and rotatably mounting to said two supporting walls in such a manner that said striker wheel is normally free rotated with respect to said wheel axles, and wherein each of said two driving caps comprises an inner sidewall extending from a circular edge of said driving ring, wherein each of said driving ring has an inner circumferential surface, and a circular driving cavity formed
15 within said driving ring and said inner sidewall, each of said driving cavities having a diameter larger than that of said striker driving wheels of said driven gear elements, wherein each of said inner sidewalls has a central support hole for said support shank of said respective driven gear element passing through while said respective striker driving wheel is received in said driving cavity, wherein said two inner sidewalls of said driving
20 caps are disposed in said two supporting gaps respectively so as to hold said two driving caps in a position between said striker wheel and said two driven gear elements respectively, wherein said driving caps are arranged to engage with said striker driving wheels.

16. The ignition unit, as recited in claim 15, wherein said two driving caps are
25 embodied as a free rotating driving cap and a fixed driving cap respectively, said driving cavity of said free rotating driving cap having a diameter larger than that of said striker driving wheel of said respective driven gear element such that said free rotating driving cap is normally free rotated with respect to said respective driven gear element, said driving cavity of said fixed driving cap having a diameter slightly larger than that of said
30 striker driving wheel of said another driven gear element such that said fixed driving cap is normally engaged with said respective driven gear element.

17. The ignition unit, as recited in claim 16, further comprising a plurality of driving teeth spacedly provided on said inner circumferential surface of said free rotating
35 driving cap and a plurality of driven gear teeth spacedly provided on said outer

circumferential surface of said striker driving wheel of said respective driven gear element, wherein said respective striker driving wheel is driven to rotate by said free rotating driving cap when said driven teeth are engaged with said driving teeth, wherein said free rotating driving cap is normally rotated about said respective driven gear
5 element in a free rotatably movable manner unless a downward force is intentionally applied on said free rotating driving cap while rotating said free rotating driving cap to drive said respective driven gear element to rotate.

18. The ignition unit, as recited in claim 17, further comprising a second set of driving teeth spacedly provided on said inner circumferential surface of said fixed driving
10 cap and a second set of driven gear teeth spacedly provided on said outer circumferential surface of said striker driving wheel of said respective driven gear element, wherein said driving teeth of said fixed driving cap are normally engaged with said driven gear teeth of said fixed driving cap such that when said fixed driving cap is intentionally rotated, said respective driven gear element is driven to rotate.

15 19. The ignition unit, as recited in claim 17, wherein said inner circumferential surface of said fixed driving cap is normally and frictionally engaged with said outer circumferential surface of said striker driving wheel of said respective driven gear element such that said fixed driving cap is rotated to frictionally drive said respective driven gear element to rotate.

20 20. The ignition unit, as recited in claim 17, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

25 21. The ignition unit, as recited in claim 18, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

30 22. The ignition unit, as recited in claim 19, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer

circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

23. The ignition unit, as recited in claim 15, wherein said two driving caps are
5 normally and respectively rotated about said two driven gear elements in a free rotatably movable manner unless a downward force is intentionally applied on said driving caps while rotating said driving caps to drive said driven gear element to rotate.

24. The ignition unit, as recited in claim 23, further comprising a plurality of
10 driving teeth spacedly provided on said inner circumferential surface of each of said driving caps and a plurality of driven gear teeth spacedly provided on said outer circumferential surface of each of said striker driving wheels, wherein said striker driving wheels are driven to rotate by said rotating driving caps when said driven teeth are engaged with said driving teeth respectively.

25. The ignition unit, as recited in claim 23, wherein said driving caps are
15 normally rotated about said respective driven gear element in a free rotatably movable manner unless said downward force is intentionally applied on said driving caps to frictionally engage said inner circumferential surfaces of said driving caps with said outer circumferential surfaces of said striker driving wheels while rotating said driving caps to drive said respective driven gear elements to rotate

20 26. The ignition unit, as recited in claim 23, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

25 27. The ignition unit, as recited in claim 24, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

28. The ignition unit, as recited in claim 25, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

29. The ignition unit, as recited in claim 15, wherein each said driving cavity of said driving caps has a diameter slightly larger than that of said respective striker driving wheel of said driven gear element such that said driving caps are normally engaged with said driven gear elements to respectively drive said driven gear elements to rotate.

30. The ignition unit, as recited in claim 29, further comprising a plurality of driving teeth spacedly provided on said inner circumferential surface of each of said driving caps and a plurality of driven gear teeth spacedly provided on said outer circumferential surface of each of said striker driving wheels, wherein said driving teeth of said driving caps are normally engaged with said driven gear teeth of said driving caps such that when said driving caps are intentionally rotated, said driven gear elements are driven to rotate.

31. The ignition unit, as recited in claim 29, wherein said inner circumferential surface of each of said driving cap is normally and frictionally engaged with said outer circumferential surface of each of said striker driving wheels such that said driving caps are rotated to frictionally drive said driven gear elements to rotate.

32. The ignition unit, as recited in claim 29, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

33. The ignition unit, as recited in claim 30, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

34. The ignition unit, as recited in claim 31, wherein said slipping surface of each said driving caps, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving cap.

35. The ignition unit, as recited in claim 14, wherein each of said wheel axles is integrally and coaxially extended from an inner side of said respective driving ring to form said driving unit in a one-piece integral manner.

36. The ignition unit, as recited in claim 35, wherein said slipping surface of each said driving rings, having a round shaped, is radially projected to form said outer circumferential surface of said driving ring, wherein a thickness of said driving ring is gradually reduced from a mid-portion to two outer edges thereof so as to form said round slipping surface of said driving ring.